

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Jens WILDHAGEN

U.S. Serial No.: Filed Concurrently Herewith

Title of Invention: NOISE REDUCTION IN A STEREO RECEIVER

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PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Box Patent Application (35 U.S.C. 111)
Washington, D.C. 20231

Sir:

Before the issuance of the first Office Action, please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 3, 5, 6, 9, 10, 12, 14, 18 and 21 as follows:

3. (Amended) Method according to claim 1, **characterized by** determining the frequency selectivity by dividing the stereo difference signal into subbands.

5. (Amended) Method according to claim 3, **characterized by** determining a width of a respective subband according to the properties of the human auditory system.
6. (Amended) Method according to claim 3, **characterized by** attenuating every subband of the stereo difference signal which noise component lies above a signal component of a subband of the audio signal corresponding to that of the stereo difference signal so that the noise component of the subband of the stereo difference lies below the respective absolute value of masking.
9. (Amended) Method according to claim 7, **characterized by** subtracting a respective influence factor (K_O, \dots, K_N) from the attenuation factor of a respective subband to reduce the influence of noise in the signal component to the attenuation signal.
10. (Amended) Method according to claim 6, **characterized by** determining the noise component of a subband of the stereo difference signal on basis of its noise power which is determined by filtering an in quadrature component of the stereo difference signal into the respective subband and rms filtering the corresponding subband.
12. (Amended) Method according to claim 6, **characterized by** determining the signal component corresponding to a subband of the stereo difference signal according to the fieldstrength of the received fm signal, a volume of output sound, a background noise level, the signal amplitude power of the audio signal, a speed of a vehicle within which the stereo signal is reproduced, and/or the ratio of the signal power to the noise power of the difference signal of the corresponding subband.
14. (Amended) Computer program product, comprising computer program means adapted to perform the method steps as defined in claim 1 when it is executed on a computer or digital signal processor.

18. (Amended) Noise reducer according to claim 15, **characterized in that** said weighting factor determination unit comprises

- a mixer (6) and a first lowpass filter (7) to determine the noise component of the stereo difference signal (1-r) by deriving its in quadrature component, and
- a second filter bank (8) having the same characteristics as the first filter bank (8) having the same characteristics as the first filter bank (1) to determine the noise component of each of the subbands of the stereo difference signal (1-r).

21. (Amended) Noise reducer according to claim 16, **characterized in that** said weighting factor determination unit comprises

- a third filter bank (11) having basically the same characteristics as the first filter bank (1) to determine the signal component of each of subbands of the stereo sum signal (1+r) corresponding to the subbands of the stereo difference signal (1-r).

REMARKS

Claims 1-23 remain in the application. Claims 3, 5, 6, 9, 10, 12, 14, 18 and 21 have been amended to eliminate multiple dependencies. Attached hereto is a marked up version of the changes made to claims 3, 5, 6, 9, 10, 12, 14, 18 and 21 by the current amendment. The attached page is captioned **"Version with markings to show changes made."** The filing fee has been calculated based upon these amendments to the claims.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE**In the claims:**

3. (Amended) Method according to claim 1 ~~or~~ 2, **characterized by** determining the frequency selectivity by dividing the stereo difference signal into subbands.
5. (Amended) Method according to claim 3 ~~or~~ 4, **characterized by** determining a width of a respective subband according to the properties of the human auditory system.
6. (Amended) Method according to claim 3, 4 ~~or~~ 5, **characterized by** attenuating every subband of the stereo difference signal which noise component lies above a signal component of a subband of the audio signal corresponding to that of the stereo difference signal so that the noise component of the subband of the stereo difference lies below the respective absolute value of masking.
9. (Amended) Method according to claim 7 ~~or~~ 8, **characterized by** subtracting a respective influence factor (k_O , K_N) from the attenuation factor of a respective subband to reduce the influence of noise in the signal component to the attenuation signal.
10. (Amended) Method according to claim 6 ~~anyone of claims 6 to 9~~, **characterized by** determining the noise component of a subband of the stereo difference signal on basis of its noise power which is determined by filtering an in quadrature component of the stereo difference signal into the respective subband and rms filtering the corresponding subband.
12. (Amended) Method according to claim 6 ~~anyone of claims 6 to 11~~, **characterized by** determining the signal component corresponding to a subband of the stereo difference signal according to the fieldstrength of the received fm signal, a volume of output sound, a background noise level, the signal amplitude power of the audio signal, a speed of a vehicle within which the

stereo signal is reproduced, and/or the ratio of the signal power to the noise power of the difference signal of the corresponding subband.

14. (Amended) Computer program product, comprising computer program means adapted to perform the method steps as defined in claim 1 ~~anyone of claims 1 to 13~~ when it is executed on a computer or digital signal processor.

18. (Amended) Noise reducer according to claim 15, ~~16 or 17~~, **characterized in that** said weighting factor determination unit comprises

- a mixer (6) and a first lowpass filter (7) to determine the noise component of the stereo difference signal (1-r) by deriving its in quadrature component, and
- a second filter bank (8) having the same characteristics as the first filter bank (8) having the same characteristics as the first filter bank (1) to determine the noise component of each of the subbands of the stereo difference signal (1-r).

21. (Amended) Noise reducer according to claim 16 , ~~anyone of claims 16 to 20~~ **characterized in that** said weighting factor determination unit comprises

- a third filter bank (11) having basically the same characteristics as the first filter bank (1) to determine the signal component of each of subbands of the stereo sum signal (1+r) corresponding to the subbands of the stereo difference signal (1-r).